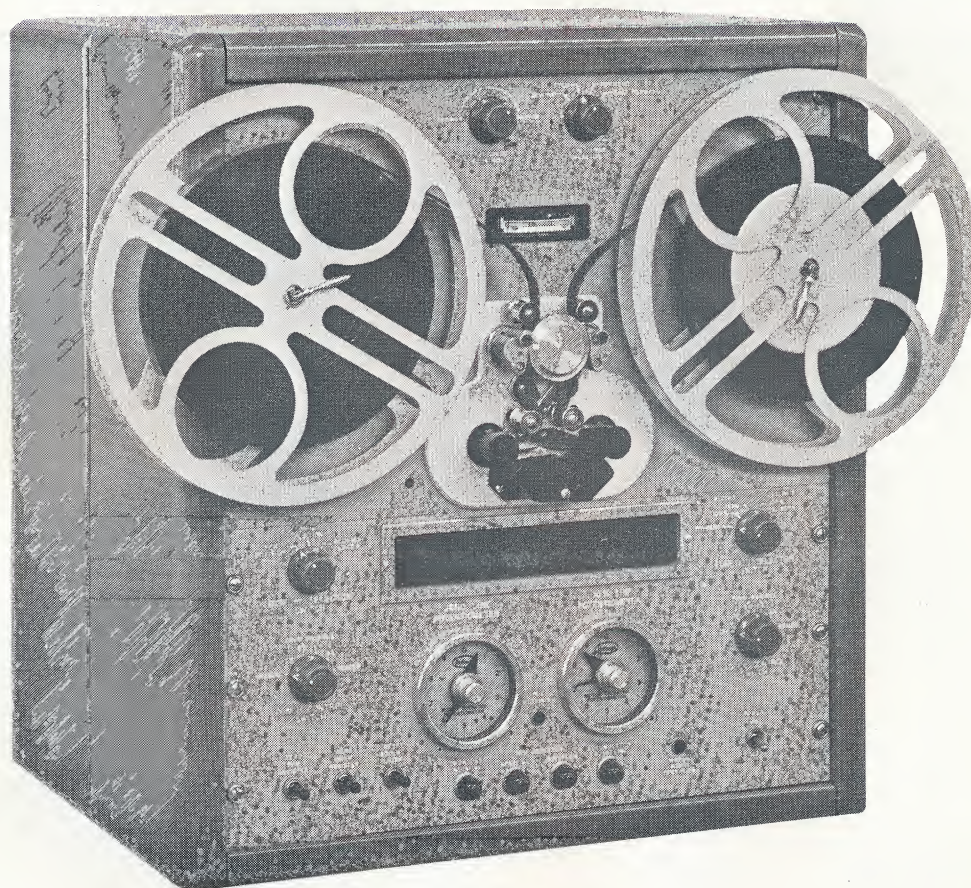


Hoffman / SPECTROPHOTOMETER DATA PROCESSOR MODEL HSC 101



The Hoffman Spectrophotometer Data Processor Model HSC 101 has been developed to operate with most dual beam spectrophotometers.

FUNCTIONS

- COMPARES SPECIMENS AGAINST A STANDARD SPECIMEN
- INTEGRATES PEN POSITION
- CORRECTS SPECTROPHOTOMETER 100% LINE
- DIGITIZES AND PUNCHES OUTPUT ON PAPER TAPE

The Hoffman Spectrophotometer Data Processor contains a digital magnetic tape memory. This memory is used to store data defining a standard or known specimen, or the spectrophotometer 100% calibration curve. This information is pre-recorded prior to a specimen run by making a calibration run on the spectrophotometer. During this run, the error of the ratio between the two beams is stored on the Data Processor magnetic tape. The tape is then rewound prior to the specimen run.

During a specimen run, the tape is synchronized with the wavelength dial drive and played back – the stored data modifying that obtained by the spectrophotometer. The resulting data is plotted on the spectrophotometer chart recorder and may be punched out on paper tape according to manually selectable wavelength increments or as programmed by the tape reader.

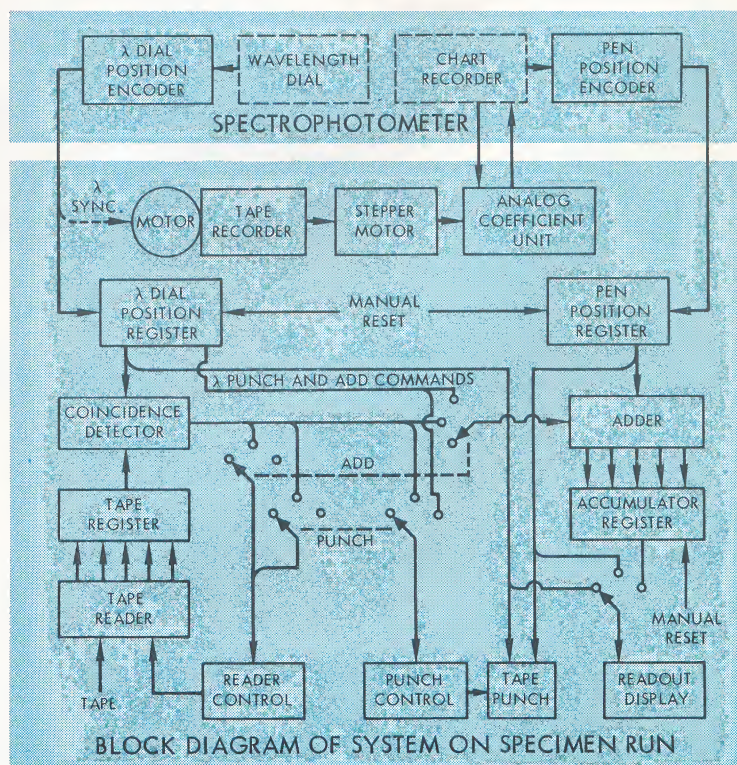
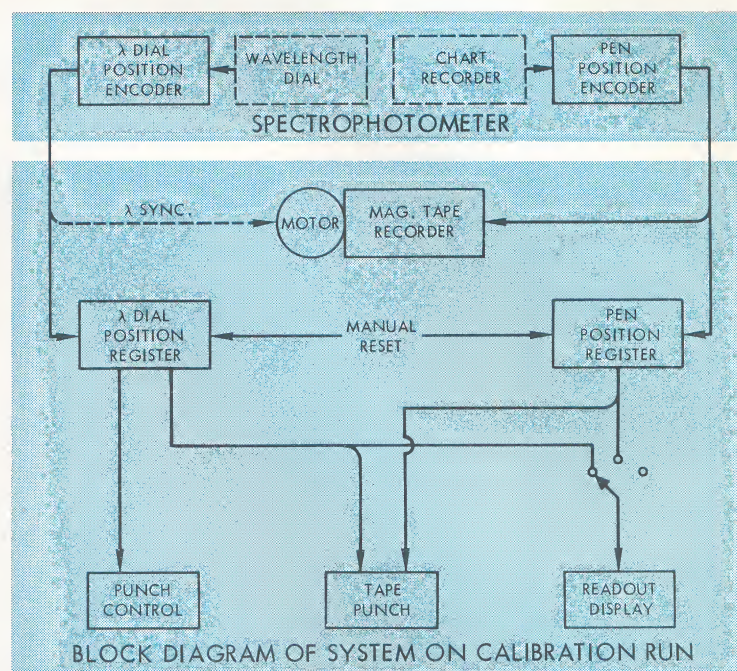
The Spectrophotometer Data Processor is flexible, straightforward, and simple to operate. Once a calibration run has recorded the "Standard Data" on the magnetic tape, any number of specimen runs may be made providing test conditions are not changed.

The Data Processor is all solid-state and is designed to be easily adapted to any make or model dual beam spectrophotometer. As depicted in the block diagrams, one digital encoder is added within the spectrophotometer to the wavelength dial, and one to the recorder pen. The pen servo feedback loop is adjusted by the analog coefficient unit to cause the corrected spectral plot to be drawn.

The Hoffman Spectrophotometer Data Processor can be furnished with the following functions:

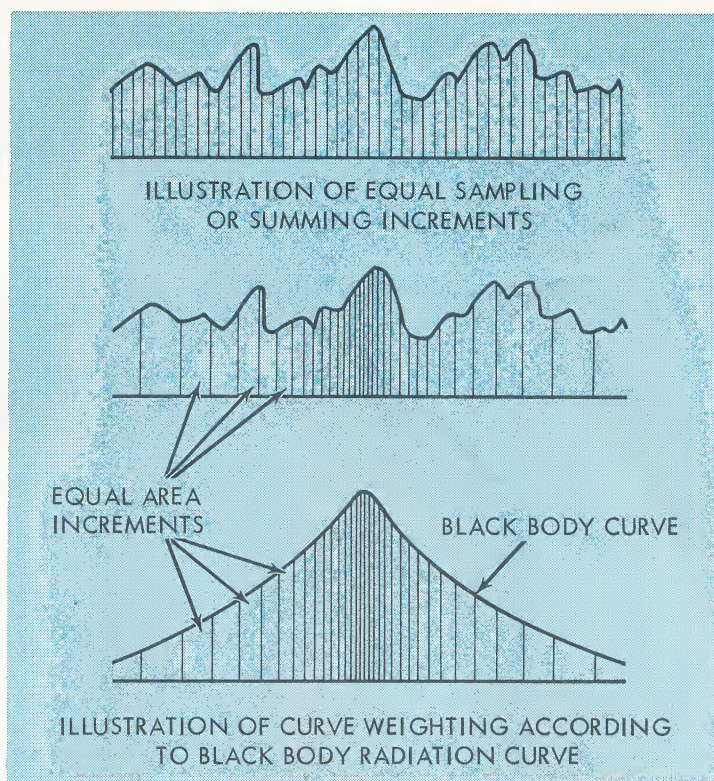
- Pen position and wavelength digitizing with punched tape output.
Tape input programming.
- Spectral curve matching and 100% line error correction:
Punched tape output.
Tape output and input tape programming.
Zero percent line error correction.
- Spectral curve integration with any function of the above two items.

DESCRIPTION OF OPERATION



MODES OF OPERATION

- SPECTRAL CURVE MATCHING
- SPECTROPHOTOMETER CALIBRATION
- SPECTRAL CURVE INTEGRATION



SPECTRAL CURVE MATCHING • A calibration run is made with the reference specimen placed in the spectrophotometer system. The ratio of the two beams is recorded in the Data Processor memory. When a second specimen is placed in the spectrophotometer system and a run is made with the Data Processor switched to playback synchronized with the wavelength dial, the pen plot will be a straight line except in the regions in which the spectra of the sample differs from the reference specimen. In such regions, the plot will indicate the degree to which the spectra differ.

SPECTROPHOTOMETER CALIBRATION • Correction of the spectrophotometer's 100% line is made by making a run without a specimen/sample, and recording in the Data Processor memory the error of the ratio between the two beams. As a check on correct operation, a second run can be made with the Data Processor switched to playback synchronized with the wavelength dial drive. The pen recording should then indicate correct compensation, i.e., a straight line at 100%. When a specimen is placed in the spectrophotometer system and the Data Processor synchronized to playback, as done previously, the chart recorder will display the corrected percentage of transmittance or spectral emittance directly.

The capability to additionally correct for the zero percent line has been desired for use with some spectrophotometers and is available as an option.

SPECTRAL CURVE INTEGRATION • The Data Processor has an accumulator which allows summing the recorder pen position values at equal wavelength increments of 0.5, 1, 5, or 10 dial divisions. This output is proportional to the area under an emittance, transmittance or reflectance curve.

To enhance the value of this integration, the summing increments can also be pre-programmed for any wavelength values by using the punched tape reader input. This allows weighting the values of pen position in such a way as to compensate for prism characteristics, black body radiation curves at various temperatures or other such variables.

SYSTEM SPECIFICATIONS

MEMORY	Magnetic tape recorder, 1200 feet of 16mm sprocketed tape. Tape drive motor is synchronized with the wavelength dial drive.
WAVELENGTH REGISTER	Up to 5 decades to a count of 49999 plus a negative count indicator.
PEN REGISTER	Three decades to a count of 999 plus overflow and negative count indicators.
ACCUMULATOR	Six decades to a count of 999999 with the least significant digit not displayed.
READOUT DISPLAY	Five decades switchable to display wavelength, pen, or accumulator registers.
OUTPUT CORRECTION	The analog coefficient unit consists of a Stepper motor driven precision potentiometer which applies a correction voltage to chart recorder pen servo. Up to 200 steps/second; 1000 steps for 0 - 100% correction.
ENCODERS	Segmented disk chops light beam to provide output pulses. Two output phases allow detection of direction of movement.
TAPE PUNCH	Perforates paper tape with five digits of wavelength dial register, three digits of pen position register, and adds a carriage return character to each block of data. Punches up to 100 blocks/minute. May be manually switched to punch at each 0.5, 1, 5, or 10 wavelength dial divisions, or will punch upon wavelength coincidence with data from tape reader.
TAPE READER	Reads wavelength data from the punched tape. Upon coincidence, tape advances reading in new data. Reads up to 100 blocks/minute. Programs tape punch operation or wavelength intervals for integrating.
WEIGHT	Approximately 200 lbs. , including punch and reader.
SIZE	22" wide x 17" deep x 23.5" high, without tape reels.
POWER	115 VAC, 60 cycles.



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17 June 1966

Mr. T. Nelson
Systems Consultant
Box 1546
Poughkeepsie, New York 12604


Dear Mr. Nelson:

Per your request we are pleased to send you our brochure on the Hoffman Spectrophotometer Data Processor Model HSC 101.

If any additional information is desired, please contact the undersigned .

Yours very truly,

HOFFMAN/Electronics Corporation
Industrial Products Division


M. C. Evans
General Manager

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Encl: (1)

